香港房屋委員會
Hong Kong Housing Authority

Designing for Safety

Building Secure and Sustainable Communities

16 Oct 2025

aurecon
Bringing ideas to life

CONSTRUCTION INDUSTRY COUNCIL
建造業議會

Agenda for Today

- Objective

- Overview of DfS Management System

- Introduce DfS Risk Control Framework

- How to implement DfS
  - Roles & Responsibilities
  - Templates & Tools

Why Safety Matters

- Construction is recognised as one of the **most hazardous industries globally**.
- In addition to the **human cost**, such accidents contribute to **project delays, financial losses**, and damage to organisational **reputation**.
- Prioritising safety extends beyond mere compliance; it embodies a culture of safety that begins with strong leadership.

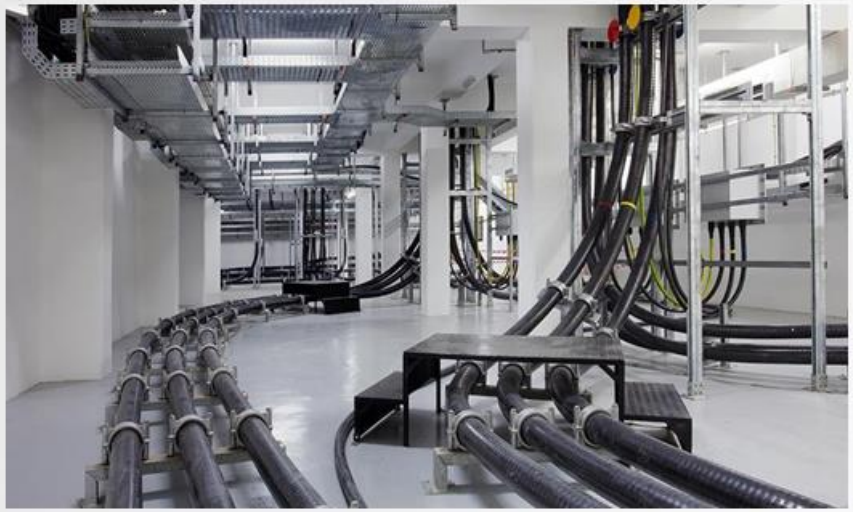
Construction Sector Accidents and Fatalities								
	No. of Reportable Accidents in Construction Sector				No of Fatal Injuries			
Year	2021	2022	2023	2024	2021	2022	2023	2024
Hong Kong	3109	3046	3097	3097	23	17	20	14
Singapore	139	171	167	166	13	14	18	20

aurecon
Bringing ideas to life

Why Design for Safety

Below is an example of integrating DfS in a live substation: maintaining safe access routes at the 275 kV cable flat.

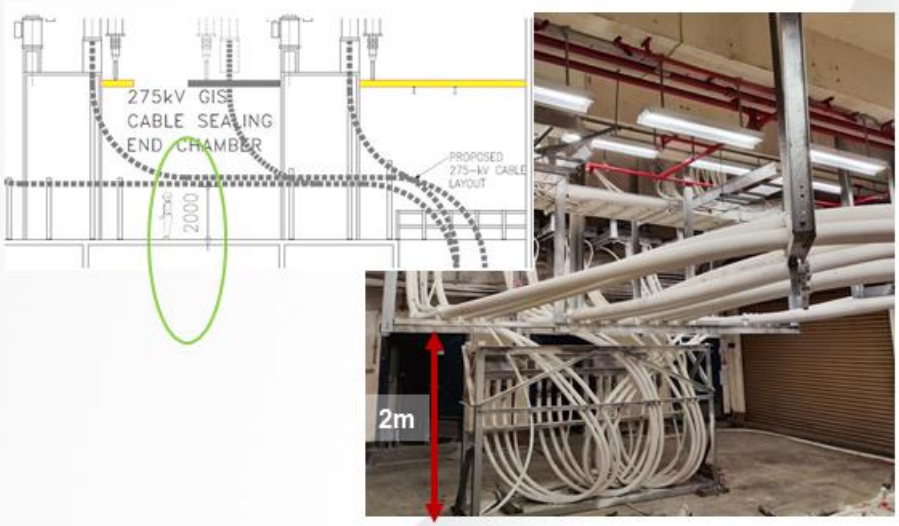
Before



Current Control Measure

- Installation of metallic platforms over transmission cables to maintain access routes
- Risk: Cannot maintain a flat and clear access routes at ground level

After



Safety Improvements

- Improved cable installation above ground at about **2 m** for new-built
- Striking a balance between limited height of floor and maintenance requirements
- Maintaining a more safe and clear access routes at ground level
- Providing more space for future cable diversion, maintenance and enhancement

aurecon
Bringing ideas to life

Objectives

Build understanding: Increase awareness of DfS principles and the DfS Management System across project stakeholders.

Enable application: Equip teams to implement DfS using standard templates, checklists, and workflows for consistent delivery from brief through O&M.

Strengthen safety culture: Embed the risk-control hierarchy and proactive hazard identification to reduce incidents, rework, and delay.

aurecon
Bringing ideas to life

Overview of DfS Management System

aurecon

Bringing ideas to life

Overview of the DFS Management System

Background & Introduction

Hong Kong's Journey to Safer Design Practice

- DfS (Design for Safety) in Hong Kong is modeled after the UK's Safety in Design and CDM framework.
- First introduced in 2006, DfS was integrated throughout local construction projects by 2016.
- In 2020, the CIC Task Force established a roadmap to develop a comprehensive DfS Management System.

What is 'Design for Safety"

Design for Safety **involves identifying and mitigating potential hazards early** in the design process and throughout the project lifecycle.

Key Duty Holders

Client | Designer | Contractor | Maintenance Supervisor | Functional Roles (client rep, architect, AP, PM)

DfS Core Guiding Principles

Communication & Coordination

- Regular Monitoring and Sharing of Key H&S Files
- Regular Review Meetings
- Set up Feedback Mechanism
- Establish Centralised Knowledge Hub to Share Information

Ownership & Leadership

- Integrate H&S into Key Business Decisions
- Ensure Appointment and Resources Competency through Regular Audits and KPI Tracking Mechanism

Risk Prevention & Management

- Reduce Risk at Source
- Early Contractor Involvement
- Manage Key Information in the H&S Files
- Apply Digital Tools to Enhance Risk Identification

Evaluation & Training

- Assess H&S Knowledge, Skills and Experience
- Accredit Training Course with CPD Provided
- Track Lesson Learnt and Assess Key Risks and Design Changes

Stages & Phases

Project set up | Pre-tender | Tender | Construction | Handover | Operation & Maintenance

Introduce DfS Risk Control Framework

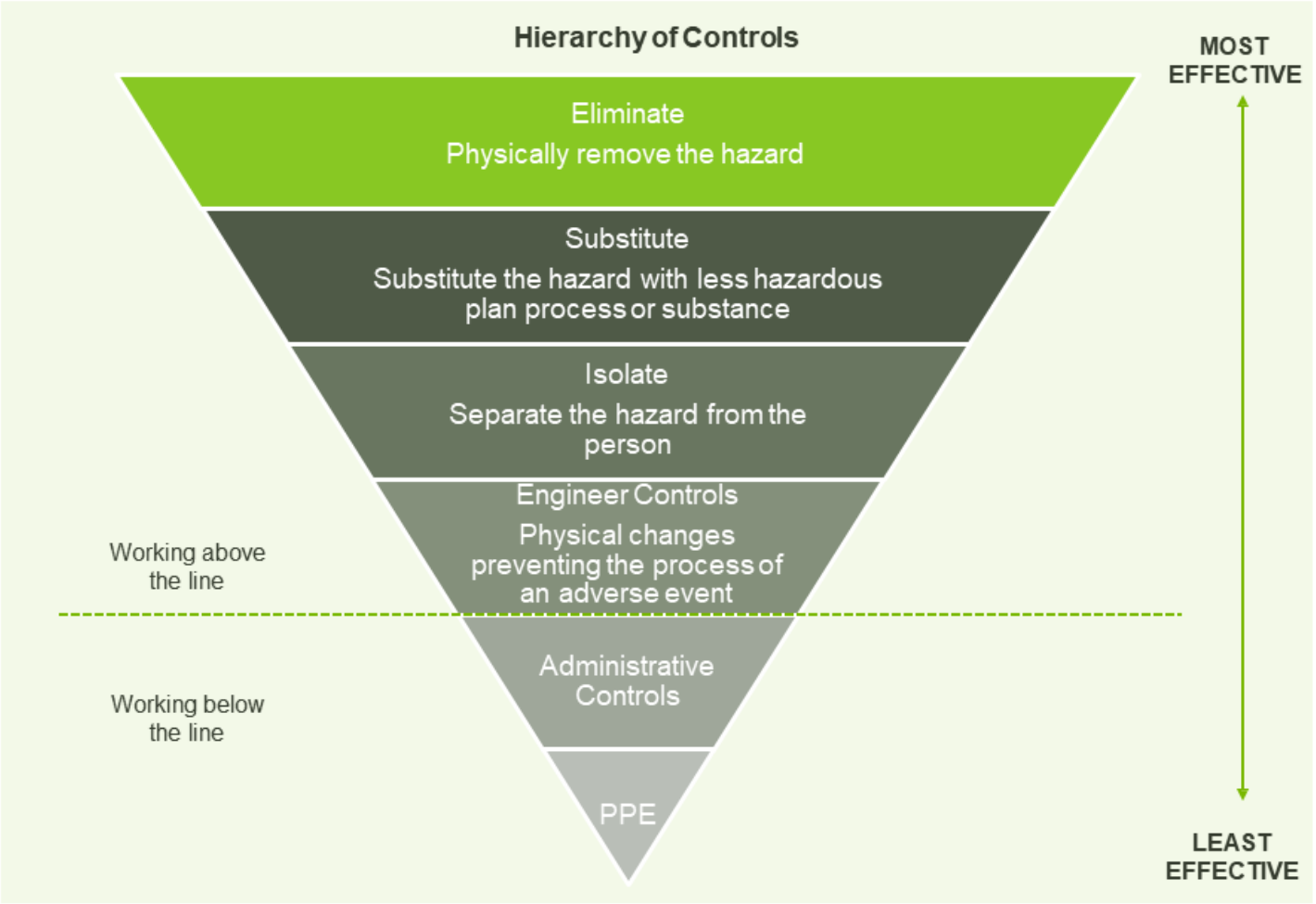
aurecon

Bringing ideas to life

How to Identify, Assess, and Control Risks Using the Reasonably Practicable Approach (1/2)

We can **produce a safe design** through:

- Consultation, engagement and drawing on experiences
- Analysis of asset interfaces to identify hazards
- Eliminate hazard or minimise risks
- Use of Hierarchy of Control
- Life of the asset

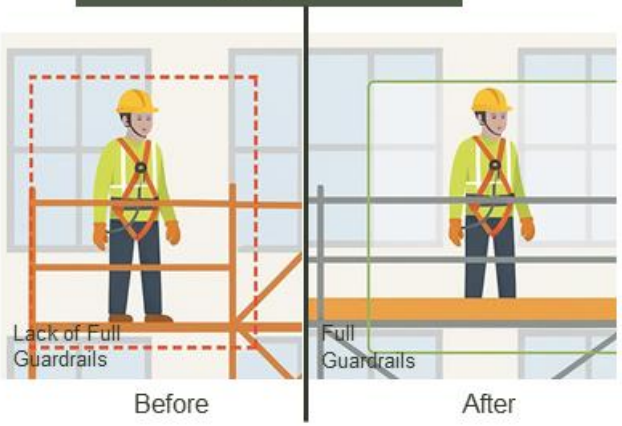


How to Identify, Assess, and Control Risks Using the Reasonably Practicable Approach (2/2)

Eliminate

Substitute

Isolate



Engineer Controls

Administrative Controls

PPE

How to Implement DfS

- Roles & Responsibilities
- Detailed Implementation Plan
- Templates & Tools

aurecon

Bringing ideas to life

Roles & Responsibilities

aurecon

Bringing ideas to life

Roles & Responsibilities

Effective DfS implementation relies on clear roles and responsibilities. We have outlined the expectations for the **Client, Designer, and Constructor** throughout the project lifecycle to help with smooth integration of DfS.

1 For Client (1/3)

The Client is responsible for ensuring the successful implementation of DfS by **providing management support, appointing and empowering key roles, promoting a strong safety culture, coordinating risk management, and overseeing all phases** from project setup through to completion.

Duty Holders	Stage	Responsibilities
	All Stages	**Promote Safety Culture**
		Ensure a "safety first" mentality is embedded across all project phases.
		Apply H&S incentives or benchmarks to duty holders.
		Address cost concerns that could hinder health and safety.
		Risk Management
		Coordinate sharing of identified risks to eliminate or mitigate them throughout the project.
		Require all duty holders to remove or minimize significant risks at their source.
		Management Arrangements
		Ensure management arrangements are established, maintained, and actioned throughout the project lifecycle.
		Allocate sufficient time and resources for the project's success.
		Lessons Learned
		Set and review lessons learned with the Designer, Contractor, and Maintenance Supervisor throughout the project lifecycle.

Roles & Responsibilities

1 For Client (2/3)

The Client is responsible for ensuring the successful implementation of DfS by **providing management support, appointing and empowering key roles, promoting a strong safety culture, coordinating risk management, and overseeing all phases** from project setup through to completion.

Client	**Project Set Up Phase**	**Establish Information**
		Provide relevant information to the project team for proper planning and execution.
		Embed DfS principals and practices in the contract documents
		Role Assignments
		Appoint and empower the Designer. - A Designer to undertake the project and ensure other roles are competent by accessing qualifications, experience, and professional membership status - A Designer to comply with their duties in terms of DfS
		Group duty holder leads into a project review team
		KPI Setting
		Set and review KPIs, both Lead & Lagging Indicators, for the Designer and other involved parties.
	Design Phase	**Safety Consultation**
		Be advised by the Designer on safety and health aspects, including design finalisation and material selection.
		Risk Reduction in Design
		Work with the Designer to reduce significant risks during the design process.
		Pre-Construction Plan
		Provide Pre-Construction Information before work commences.
		KPI Review
		Review performance against KPIs during the construction phase.
		Welfare Facilities

Roles & Responsibilities

1 For Client (3/3)

The Client is responsible for ensuring the successful implementation of DfS by **providing management support, appointing and empowering key roles, promoting a strong safety culture, coordinating risk management, and overseeing all phases** from project setup through to completion.

	Construction Phase	**Welfare Facilities**
		Ensure that sufficient welfare facilities are provided by the Main Contractor and checked at the start and maintained throughout the project.
		Construction Phase Plan
		Ensure the Contractor's Construction Phase Plan has adequate arrangements to manage identified risks.
		Ensure construction can be carried out safely without health risks to anyone involved.
		Rehearsals and Risk Identification
		Promote rehearsals to identify and eliminate or reduce significant risks.
		Completion and Handover
		Check completion and handover arrangements before project completion.
		KPI Review
		Review performance against KPIs during the construction phase.

Roles & Responsibilities

Effective DfS implementation relies on clear roles and responsibilities. We have outlined the expectations for the **Client, Designer (Functional role to coordinate DfS), and Constructor** throughout the project lifecycle to help with smooth integration of DfS.

2 For Designer (Functional role to coordinate DfS) (1/3)

- The coordination role of the Designer, **appointed by the client**, is essential for **leading and integrating DfS** throughout the project. This role can be filled by a **Client Representative, Architect, Authorized Person, or Project Manager**.
- If the designer lacks DfS capabilities and there are no in-house health and safety resources available, the Client can appoint a coordinator or team to handle the role.
- The functional role ensures that DfS principles are integrated throughout the project. This role involves **coordinating with stakeholders, leading DfS meetings, maintaining documentation, and using digital tools** to identify and reduce risks.

Duty Holders	Stage	Responsibilities
	All Stages	**Coordination with Design Team**
		Check, monitor, and coordinate to ensure that designers are fulfilling their duties.
		Review lessons learnt with the Design Team
		Documentation & Information Sharing
		Ensure that all relevant information on significant risks and their mitigation is provided to the Client.
		Demonstrate that information has been shared effectively and is accessible (such as using a Common Data Environment) to all relevant parties.
		Use standardised templates and auditable procedures to maintain uniform documentation.
	Project Set Up Phase	**Establish DfS Processes**
		Set up regular DfS review meetings.
		Maintain the DfS Register and Pre-Construction Information (PCI).
		Establish key relevant information and processes for the project.

Roles & Responsibilities

2 For Designer (Functional role to coordinate DfS) (2/3)

- The coordination role of the Designer, **appointed by the client**, is essential for **leading and integrating DfS** throughout the project. This role can be filled by a **Client Representative, Architect, Authorized Person, or Project Manager**.
- If the designer lacks DfS capabilities and there are no in-house health and safety resources available, the Client can appoint a coordinator or team to handle the role.
- The functional role ensures that DfS principles are integrated throughout the project. This role involves **coordinating with stakeholders, leading DfS meetings, maintaining documentation, and using digital tools** to identify and reduce risks.

Designer	**Design Phase**	**Planning & Monitoring**
		Plan, manage, and monitor the design work, ensuring Health & Safety considerations are integrated.
		Oversee and coordinate with designers to identify modern building techniques and mitigate significant risks.
		Information Flow & Coordination
		Assist the Client in gathering pre-construction information.
		Provide pre-construction information to the Designer (lead/coordinating role) and Contractors, including the Main Contractor.
		Risk Identification & Mitigation
		Identify and analyse risks at the source and ensure all duty holders work to remove or minimise these risks.
		Provide all relevant information on each foreseeable significant risk* identified and its mitigation to the Client
		Lead the use of digital tools (like BIM) to visualise and reduce risks.

Roles & Responsibilities

2 For Designer (Functional role to coordinate DfS) (3/3)

- The coordination role of the Designer, **appointed by the client**, is essential for **leading and integrating DfS** throughout the project. This role can be filled by a **Client Representative, Architect, Authorized Person, or Project Manager**.
- If the designer lacks DfS capabilities and there are no in-house health and safety resources available, the Client can appoint a coordinator or team to handle the role.
- The functional role ensures that DfS principles are integrated throughout the project. This role involves **coordinating with stakeholders, leading DfS meetings, maintaining documentation, and using digital tools** to identify and reduce risks.

	Construction Phase	**Coordination with Contractors**
		Coordinate with the Main Contractor to ensure that the design is aligned with safety and construction requirements.
		Liaise with the Main Contractor to ensure design coordination throughout the construction phase.
		Provide construction information and updates to the Main Contractor, including any design changes or potential issues.
	Post Construction Phase	**Future Improvement**
		Gather and incorporate feedback from users to improve future designs, through methods such as: Post-occupancy evaluations Defect reports Accident investigation reports User difficulties

Roles & Responsibilities

Effective DfS implementation relies on clear roles and responsibilities. We have outlined the expectations for the **Client, Designer (Functional roles to coordinate DfS), and Constructor** throughout the project lifecycle to help with smooth integration of DfS.

3 For Contractor (Functional role to coordinate DfS) (1/2)

- The coordination role of the Contractor, **appointed by the client**, is essential for **leading and integrating DfS** throughout the project. This role can be filled by a Main Contractor when the project engage more than one contractor.
- Client can also appoint a coordinator or team with functional role of DfS if there is lack of DfS capability of Main Contractor
- The functional role and responsibilities of a Main Contractor involves ensuring **collaboration and communication among all stakeholders throughout the construction phase**, managing health and safety risks, and maintaining compliance with safety protocols

Duty Holders	Stage	Responsibilities
Contractor	All Stages	**Informing Duty Holders on H&S Risks**
		Continuously communicate identified health and safety (H&S) risks and control measures to relevant duty holders throughout the project lifecycle.
		Cooperating and Coordinating Work
		Collaborate with other contractors and project stakeholders to ensure coordinated work efforts and safety management across the project.
		Regularly review and revise the CPP as needed to address any changes during construction.
		Review lessons learned, particularly if there are multiple contractors on the project.
	Pre-Construction	**Preparing for Construction**
		If the contractor is the only one on the project, ensure that the arrangements in the Construction Phase Plan (CPP) are adequate before construction begins.
		Provision of Information
		Ensure that all workers receive appropriate site inductions, including emergency procedures, where not provided by the Main Contractor.
		Risk Assessment Communication
		Provide information to the workforce on risks and required control measures identified through risk assessments.
		Ensure that the Construction Phase Plan (CPP) reflects the complexity of the project, incorporating updates from the Design Risk Register.

Roles & Responsibilities

3 For Contractor (Functional role to coordinate DfS) (2/2)

- The coordination role of the Contractor, **appointed by the client**, is essential for **leading and integrating DfS** throughout the project. This role can be filled by a Main Contractor when the project engage more than one contractor.
- Client can also appoint a coordinator or team with functional role of DfS if there is lack of DfS capability of Main Contractor
- The functional role and responsibilities of a Main Contractor involves ensuring **collaboration and communication among all stakeholders throughout the construction phase**, managing health and safety risks, and maintaining compliance with safety protocols

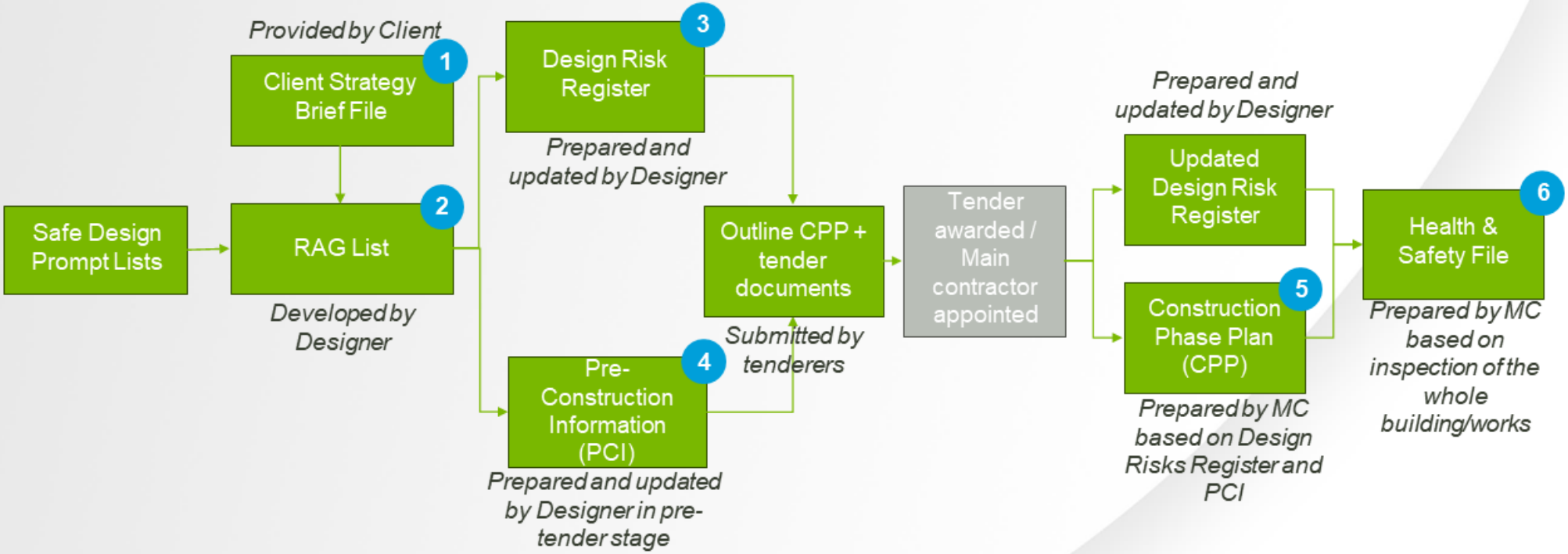
	Construction	**Health and Safety Management**
		Plan, manage, and monitor the construction stage to ensure health and safety for all workers.
		Ensure suitable welfare facilities are provided at the start and maintained throughout the works.
		Update and review the Health & Safety (H&S) File regularly throughout construction.
		Take reasonable steps to manage and mitigate H&S risks identified in the Pre-Construction Information (PCI) and during the construction stage.
		Site Management
		Keep full records of all safety and health issues, including accidents and any prosecutions.
		Provide health and safety inductions, information, and training to all workers.
		Monitoring & Coordination
		Check, monitor, and coordinate to ensure that managers, supervisors, and workers are fulfilling their health and safety duties.
		Report DfS issues on time to the design and client team when they find any potential risks.
		Share and provide relevant health and safety information with all stakeholders.

Templates & Tools

aurecon

Bringing ideas to life

Overview of DfS Documents



aurecon
Bringing ideas to life

Client Strategy Brief 1

The Client Strategy Brief document outlines key information for construction projects, detailing essential information to align stakeholders with the client's objectives. It includes **preferred project delivery methods, timelines, resources to be deployed, communication plans,** and **health and safety goals**. The document is updated as needed to **address changes and maintain safety standards** throughout the project lifecycle.

Client Strategy Brief File Template	
Project Overview	
Project Owner Information	
Name/Organization	
Email Address	
Telephone Number	
Address	
Project Description	
Type of Construction Work	
Brief description of the construction work	
Project site location	
Foreseeable site constraints and limitations? e.g. next to slope, reclaimed	
Health & Safety (H&S) Requirements	
Client H&S Expectations (if above Statutory requirements)	
H&S File – Format & Index	
Procurement Strategy	
Contract Type (e.g., Design-Bid-Build, Design-Build).	
Design for Safety (DfS) Resources Is there sufficient time and resources allocated for the implementation of Design for Safety (DfS), and are there any specific rules or requirements in the contract related to this?	
Project Timescale (What are the key stages and how long will they run for?) Please attach the detailed work program or provide a screenshot of it.	
Concept / feasibility	
Scheme Design / Planning	
Detailed Design	
Tender / Selection	
Construction / decommsioning	
Comission / handover	
Time allocation for DfS process	

Strategic Risk((what are the significant or unusual H&S risks?)			
Overall H&S Risks (e.g. challenges from major temporary works, structural			
High-Risk Work Activities (e.g. work at heights, confined space operations, or			
Is there any pre-existing risk register or relevant information & where?			
Duty Holders Involve			
Duty Holder 1			
Name		Role	
Email Address		Telephone Number	
Address			
Duty Holder 2			
Name		Role	
Email Address		Telephone Number	
Address			
Duty Holder 3			
Name		Role	
Email Address		Telephone Number	
Address			
Duty Holder 4			
Name		Role	
Email Address		Telephone Number	
Address			
Duty Holder 5			
Name		Role	
Email Address		Telephone Number	
Address			
Are the roles and responsibilities for the DfS implementation of the duty holders			
Communication Strategy			
DfS Team Meetings (Specify the frequency, duration and location)			
Feedback Mechanism (How feedback will be gathered and how any issues or action items will be tracked and			
Communication Plan (Provide details on additional communication channels or protocols to ensure all team members stay informed)			

aurecon
Bringing ideas to life

Red, Amber, Green (RAG) List for Building Work (1/4) 2

The RAG List is a tool designed to help designers identify and mitigate hazards **during the design stages** of a construction project. The lists will be used across various project phases **by designers and contractors** to continuously update and communicate potential risks, ensuring safety and compliance throughout the project lifecycle.

- Systematically categorised the **principal risk types** associated with the road asset class in various work types
- Highlighted the **key risk areas** of the work types.
- The structured approach enables designers to
  - identify project-specific risks
  - develop a tailored RAG list and design risk register

Asset Class	Work Type	Aspect	Details	Risk Exists? (Y/N)	RAG
	Foundations / Services Trenched / Inground Works	Working / Inspecting in trench	Lack of adequate safety measures in place for protection while working and inspecting in trenches	Yes	Red
		Underpinning of existing structure / infrastructure	Unstable and insecure underpinning of the existing structure/infrastructure	Yes	Amber
		Contaminants in soil	Harmful contaminants present in the soil	Yes	Red
		Groundwater	Polluted groundwater or adverse conditions that could affect safety or health	Yes	Red
	Excavations	Below ground water obstacles	Encountering unexpected utilities or remnants below ground can cause delays and increased costs.	Yes	Amber
		Installation / noise / vibration / dust	Drilling and pile driving generate noise and vibration	Yes	Red
		Effects on Adjacent Structures and Services	Excavations cause subsidence or damage to nearby buildings and disrupt utilities	No	NA
		Stability / Local / General / Rock Fall	Excavations risk endangers workers and passersby	No	NA
		Groundwater / Inflow / Diversion / Disposal	Groundwater inflow leads to additional costs and environmental concerns	Yes	Amber
		Storing / Retention / Fall Protection	Improper storage and retention lead to material falls	Yes	Red
		Loads and Access Adjacent Excavations	Adjacent loads and limited access compromise excavation stability and efficiency	Yes	Amber
		Flat Surface / Sloping Surface / Abrupt Level Changes	Uneven surfaces and level changes increase the risk of slips, trips, and falls.	Yes	Amber
		Effects of Water	Accumulated water causes erosion, weakens structures, and creates hazardous conditions.	Yes	Red
		Liquefaction	Saturated soils causes ground instability and structural damage.	No	NA
	Structural Works (Construction phase)	Access over reinforcement mats / cages – bar spacing	Narrow bar spacing creates trip hazards and limit worker movement	No	NA
		Reinforcement congestion limiting soffit access	Congested reinforcement bars restrict access, complicating installation and potentially causing delays.	Yes	Amber
		Installation of heavy reinforcement cages	Handling and installing heavy reinforcement cages leads to injury.	No	NA
		Exposed ends of reinforcement	Exposed reinforcement ends causes injuries due to improperly managed.	Yes	Red
		Glare and sunburn from metal surfaces (metal deck formwork, roof sheeting)	Reflective metal surfaces cause glare and increase the risk of sunburn for workers.	Yes	Red
		Shop and site applied paints (chemicals, access)	Poor access causes injuries.	No	NA
		Construction staging / phasing / temporary works	Poorly planned construction stages or temporary works lead to safety risks and project delays	Yes	Red
		Plant access	Restricted or unsafe access for plant machinery leads to delays, equipment damage, or accidents involving workers and machinery.		
		Construction staging / phasing / temporary works	Inadequate planning results in conflicts between trades, causing delays, increased costs, and safety hazards.		
		Commissioning / start up	Poorly managed commissioning leads to system failures, accidents, or hazardous conditions during the initial operation phase.		

Red, Amber, Green (RAG) List for Building Work (2/4) 2

Asset Class	Work Type	Aspect	Details	Risk Exists? (Y/N)	RAG
Building	Work at Height	Falling from construction platforms and floors	Falls from heights result in severe injuries or fatalities.		
		Falling objects - item dropped etc	Dropped objects cause serious injuries or fatalities to workers below.		
		Edge protection	Provide adequate edge protection to avoid severe injuries or death.		
		Inadequate back propping	Insufficient back propping results in structural collapse, causing injuries or fatalities.		
		Use of ladders	Operating cranes beyond safe limits result in tipping or collapse, endangering workers and causing significant damage.		
		Use of scaffolds	Poorly erected or maintained scaffolding causes injuries or fatalities.		
		Use of scissor / booms	Misuse or failure of scissor lifts and boom lifts results in falls or crushing injuries		
		Roof access provisions	Unsafe roof access leads to falls, resulting in serious injuries or fatalities		
		Fall arrest provisions	Lack of fall arrest systems increases the risk of severe injury or death in the event of a fall.		
	Heavy Machinery / Plant	Heavy machinery access for excavation / compaction	Limited access results in machinery accidents, equipment damage, and delays.		
		Misuse of equipment	Misuse of heavy machinery results in crushing injuries or fatalities.		
		Craneage / load lifting overhead	Poorly planned or executed crane operations lead to injuries, fatalities, or damage to structures.		
		Excessive lift or reach	Operating cranes beyond safe limits results in tipping or collapse		
		Clash of crane jibs	Collisions between cranes lead to catastrophic equipment failure and severe injuries.		
		Handling of large / bulky items	Improper handling of large items causes strain injuries or accidents, resulting in worker injury or material damage.		
	General Machinery / Plant	Egress and access	Poorly planned access routes lead to accidents, delays, and inefficient operations		
		Manual handling	Excessive manual handling causes musculoskeletal injuries and reduces worker productivity.		
		Adjacent stakeholders	Lack of coordination with nearby stakeholders leads to disruptions, safety hazards, and potential conflicts.		
		Site hygiene / cleanliness	Poor site cleanliness results in slip, trip, and fall hazards.		
	Structural Design Issues (project life)	Handrails and balustrades – types, heights, loading	Inadequate handrails or balustrades lead to falls, resulting in injuries or fatalities.		
		Impact resistance / protection / redundancy	Lack of impact resistance or redundancy leads to structural failure during an impact event, endangering lives and property.		
		Floor design loads / provisions	Underestimating floor loads results in structural failure, causing injuries, fatalities, or significant damage.		
		Access / hanging points	Insufficient access or hanging points hinder maintenance, leading to safety risks or operational inefficiencies.		

aurecon
Bringing ideas to life

Red, Amber, Green (RAG) List for Building Work (3/4) 2

Asset Class	Work Type	Aspect	Details	Risk Exists? (Y/N)	RAG
	Services Design Issues (project life)	Lightning protection	Inadequate lightning protection leads to electrical fires, equipment damage, or injury during a lightning event.		
		Earthing and bonding	Poor earthing and bonding result in electric shock hazards, equipment failure, and increased risk of fire.		
		Depth of services	Incorrect service depths lead to accidental damage during future excavation or maintenance, disrupting operations and increasing costs.		
		Temporary service provisions / future proofing	Failure to consider temporary or future service needs results in costly retrofits, operational disruptions, and safety risks.		
	Maintenance	Cleaning / maintaining facades	Lack of access or space for regular cleaning and inspection leads to material deterioration and safety hazards.		
		Cleaning / maintaining roof and gutters	Blocked access to gutters or insufficient maintenance results in water accumulation, leading to leaks and structural damage.		
		Access to elevated plant (ceilings,soffits, roofs, plant rooms)	Inadequate access to elevated plant areas hinders maintenance activities and pose safety risks.		
		Plant platforms - access, circulation,egress,testing,replacement	Insufficient space or poor design of plant platforms restricts access for maintenance		
		Cleaning / maintaining / replacing services (lighting, fire services, A/C plant etc.)	Inadequate maintenance of critical services like lighting and HVAC causes equipment failure and safety risks.		
		Cleaning / maintaining /replacing steelwork protective coatings	Failure to maintain protective coatings on steelwork leads to corrosion.		
		Hazardous substances / chemicals	Improper handling or storage of hazardous substances leads to serious health risks and environmental hazards		
		Confined / restricted spaces	Inadequate safety measures in confined spaces result in accidents such as asphyxiation or toxic exposure.		
	Operations	Egress and access	Obstructed egress and access routes delay emergency evacuations and hinder daily operations.		
		sight lines	Poor sight lines in critical areas increase the risk of accidents.		
		Clearances	Insufficient clearances cause obstructions and accidents during equipment operation.		
		Fire and smoke management	Inadequate fire and smoke management leads to catastrophic damage and loss of life.		
		Air quality	Poor air quality negatively impacts health and operational efficiency.		
		Water quality	Inadequate water quality management leads to health hazards.		
		Rubbish management	Inefficient rubbish management causes hygiene issues and operational disruptions.		
		Delivery / traffic management	Poor traffic management leads to congestion and accidents.		
		Ambulance access (stretcher/barouche)	Inadequate access for emergency vehicles delays critical response times.		
		Signage	Insufficient or unclear signage leads to confusion and accidents.		

aurecon
Bringing ideas to life

Red, Amber, Green (RAG) List for Building Work (4/4) 2

Asset Class	Work Type	Aspect	Details	Risk Exists? (Y/N)	RAG
	Operations	Ambulance access (stretcher/barouche)	Inadequate access for emergency vehicles delays critical response times.		
		Signage	Insufficient or unclear signage leads to confusion and accidents.		
		Slips and Trips / Slippery. wet or uneven surfaces	Slippery or uneven surfaces result in serious accidents.		
		Slopes and cross falls	Improperly designed slopes cause water accumulation and hazardous conditions.		
		Steps and changes in levels	Poorly designed steps and level changes cause trips and falls.		
		Electrical safety	Inadequate electrical safety results in shocks and fires.		
		Security	Insufficient security measures lead to unauthorized access and vandalism.		
		Vandalism(deliberate and accidental)	Failure to prevent vandalism results in property damage.		
		Pollutants / hazardous materials management and disposal	Improper disposal of pollutants leads to environmental contamination.		
		Lighting	Inadequate lighting reduces safety and productivity.		
		Flooding	Poor drainage leads to flooding, causing damage and disruptions.		
	Demolition(end of project life)	Falling objects in demolition	Uncontrolled falling objects during demolition cause serious injuries.		
		Damage to in ground services	Demolition can damage underground services, leading to service interruptions and hazards.		
		Damage to live services	Accidental damage to live services results in shocks and leaks.		
		Hazardous materials	Improper handling of hazardous materials leads to contamination and health risks.		
		Exposure to asbestos	Inadequate asbestos management exposes workers to severe health risks.		
		Struck by plant	Workers be struck by heavy machinery if safety protocols are not followed.		
		Post tensioning / prestressing	Improper handling during demolition leads to sudden failures and injuries.		
		Design loading	Failure to consider loading during demolition leads to structural collapse.		
		Construction staging / phasing / temporary works	Poor planning creates unsafe conditions and operational delays.		
		Disposal	Improper disposal of demolition waste leads to environmental damage.		
		Adjoining structures / infrastructure	Demolition activities inadvertently damage nearby structures or infrastructure.		

Design Risk Register (1/5) 3

The Design Risk Register is designed to identify and evaluate hazards **during the design and construction phases of a project**. It assesses the severity of potential accidents, mitigates construction hazards, and documents significant risks. It is updated by the design team during the deign and tender stage, and by the Main Contractor during the Construction Phase to incorporate any relevant design changes and address emerging hazards.

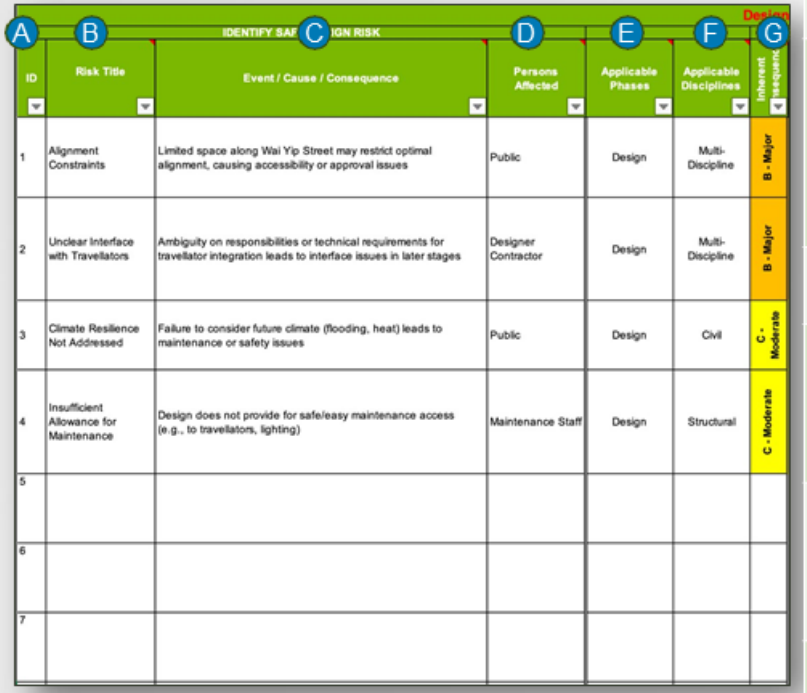
Design Risk Register Sample

IDENTIFY SAFE DESIGN RISK						ANALYSE SAFE DESIGN RISK - CURRENT EXPOSURE				IMPLEMENT SAFE DESIGN RISK TREATMENT			
ID	Risk Title	Event / Cause / Consequence	Persons Affected	Applicable Phases	Applicable Disciplines	Inherent Risk Consequence	(Risk Treatment) Current Controls	Risk Consequence	Likelihood	Risk Level	Risk Owner	Risk Evaluation	(Risk Treatment) Action Summary	Comments
1	Alignment Constraints	Limited space along Wai Yip Street may restrict optimal alignment, causing accessibility or approval issues	Public	Design	Multi-Discipline	B - Major	Conduct initial site layout review with project team including civil, architectural, and traffic engineers. Assess site constraints; Set up design coordination meetings	C - Moderate	4 - Likely	High	PM - Peter	Intolerable	Arrange joint site visits for all disciplines; Conduct workshops to evaluate alignment options; Document findings and integrate feedback into early design drawings.	24Nov2025 Peter - The risk has been mitigated
2	Unclear Interface with Travellators	Ambiguity on responsibilities or technical requirements for travellator integration leads to interface issues in later stages	Designer Contractor	Design	Multi-Discipline	B - Major	Hold interface coordination meetings with travellator supplier and all design disciplines. Draft and circulate interface responsibility matrix	B - Major	3 - Possible	Critical	M&E Coordinator - Ken	Intolerable	Prepare detailed interface control document with clear responsibilities and technical requirements; Review and update matrix at each design stage.	
3	Climate Resilience Not Addressed	Failure to consider future climate (flooding, heat) leads to maintenance or safety issues	Public	Design	Civil	C - Moderate	Preliminary climate risk assessment; Review historical weather data	C - Moderate	2 - Unlikely	Medium	PM - Peter	Intolerable	Engage expert for climate adaptation review; Integrate higher drainage capacity and shade features into early design..	
4	Insufficient Allowance for Maintenance	Design does not provide for safe/easy maintenance access (e.g., to travellators, lighting)	Maintenance Staff	Design	Structural	C - Moderate	Preliminary maintenance review; Draft O&M requirements	C - Moderate	3 - Possible	High	PM - Peter	Intolerable	Incorporate maintenance access points and working platforms in design; Review design with future maintenance team.	
5										-				
6										-				
7										-				

aurecon
Bringing ideas to life

Design Risk Register (2/5) 3

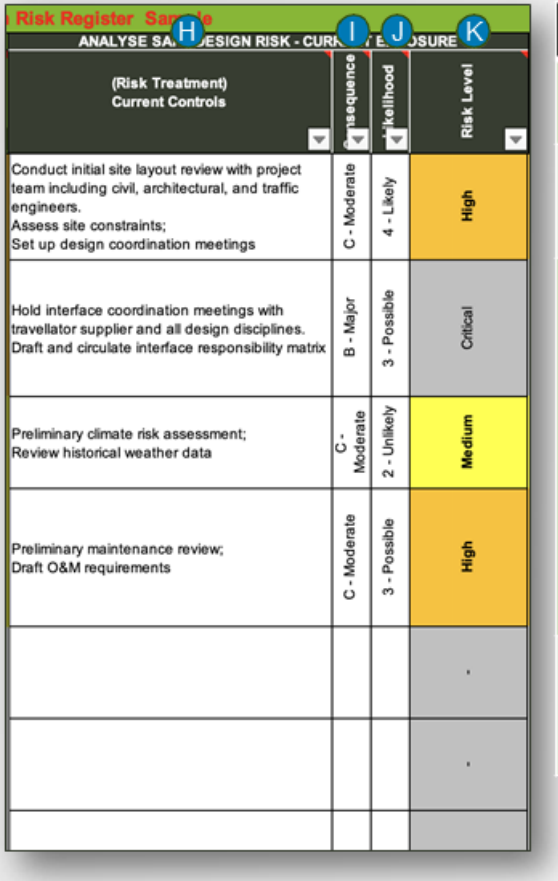
The Design Risk Register is designed to identify and evaluate hazards **during the design and construction phases of a project**. It assesses the severity of potential accidents, mitigates construction hazards, and documents significant risks. It is updated by the design team during the deign and tender stage, and by the Main Contractor during the Construction Phase to incorporate any relevant design changes and address emerging hazards.



Item	Column Name	Description
A	ID	A unique identifier for each item
B	Risk Title	This should be a simple descriptor for the purpose of reporting. The shorter the better as long as it achieves the purpose of informing what the item is.
C	Event / Cause / Consequence	This cell contains a combined descriptor for the risk, its causes, and its consequences. If the current consequence differs from the inherent consequence, this should be noted within this cell.
D	Persons Affected	Some safe design assessments require the identifications of persons who may be affected if the risk is realised.
E	Applicable Phases	Some safe design assessments require the identifications of the project phases within which the risk may realised.
F	Applicable Disciplines	Users may wish to identify the engineering disciplines associated with the risk. This enables for example the Electric Lead to quickly filter the register for risks associated with the electrical discipline.
G	Inherent Consequence	The inherent consequence is the maximum reasonably foreseeable consequence were the controls described in the <Current Controls> column not in place and effective.

Design Risk Register (3/5) 3

The Design Risk Register is designed to identify and evaluate hazards **during the design and construction phases of a project**. It assesses the severity of potential accidents, mitigates construction hazards, and documents significant risks. It is updated by the design team during the deign and tender stage, and by the Main Contractor during the Construction Phase to incorporate any relevant design changes and address emerging hazards.



Item	Column Name	Description
H	(Risk Treatment) Current Control Measures	The controls that are important in achieving the current risk level should be listed in this column. Controls should be listed as bullets.
I	Consequence	Per the header this is the **maximum reasonably foreseeable consequence** given the "Current Controls" identified in that column. The value selected in this column must match the description provided in the <Event/Cause/Consequence> column.
J	Likelihood	Per the header this is the likelihood of realising the maximum reasonably **foreseeable consequence given the "Current Controls" identified** in that column. It is not the likelihood of the risk event itself.
K	Risk Level	This value is returned as a fnc of the selected likelihood and consequence values using the heat map in the next page

aurecon
Bringing ideas to life

Design Risk Register (4/5) 3

How to Conduct Risk Assessment

Likelihood Analysis Descriptions

Category	Descriptor	Likelihood (i.e. % chance of realisation during applicable period: construction phase, operating cycle or decommissioning)	Industry Incidences (only applicable to common systems/assets)
5 - Almost Certain	The threat is expected to be realised.	90% < Likelihood ≤ 100%	Common incident
4 - Likely	The threat is likely to be realised.	5% < Likelihood ≤ 90%	Several incidents nationally
3 - Possible	The threat may be realised.	1% < Likelihood ≤ 5%	One or a few incidents nationally
2 - Unlikely	The threat is not expected to be realised.	0.1% < Likelihood ≤ 1%	No known national incidents. One or a few incidents in comparable international operating regimes.
1 - Rare	The threat may be realised in reasonably foreseeable but exceptional circumstances.	0% < Likelihood ≤ 0.1%	No known incidents in comparable international operating regimes.

Consequence Analysis Descriptions

Category	People	Property	Environment	Community
A - Catastrophic	Single or multiple fatality	Virtual complete loss of plant or system	Permanent / irreversible widespread ecological damage not able to be remediated	Outrage by a sizeable community or many communities. Riots.
B - Major	Disabling injury or illness i.e. amputation and/or permanent loss of bodily function, or any kind of permanent health impact	Extensive damage to plant or system	Extensive ecological damage, lengthy remediation process	Community/NGO legal actions. Pickets, demonstrations.
C - Moderate	Any Lost Time Incident (LTI), ie. an illness or injury resulting in one or more consecutive days or shifts off work	Significant damage to plant or system	Substantial ecological damage but able to be remediated	Persistent formal community complaints. Formal complaints to politicians or comparable representatives.
D - Minor	A medical treatment case (MTC) / or restricted work case (RWC)	Damages impact on budget and program	Localised ecological damage, easily remediated	Formal complaints from local Community complaints locally
E - Incidental	First Aid Case, or an injury or illness not requiring treatment	Minor damage to plant or system	Negligible ecological damage, may not require remediation	No Informal community complaints &/or negative comments / views.

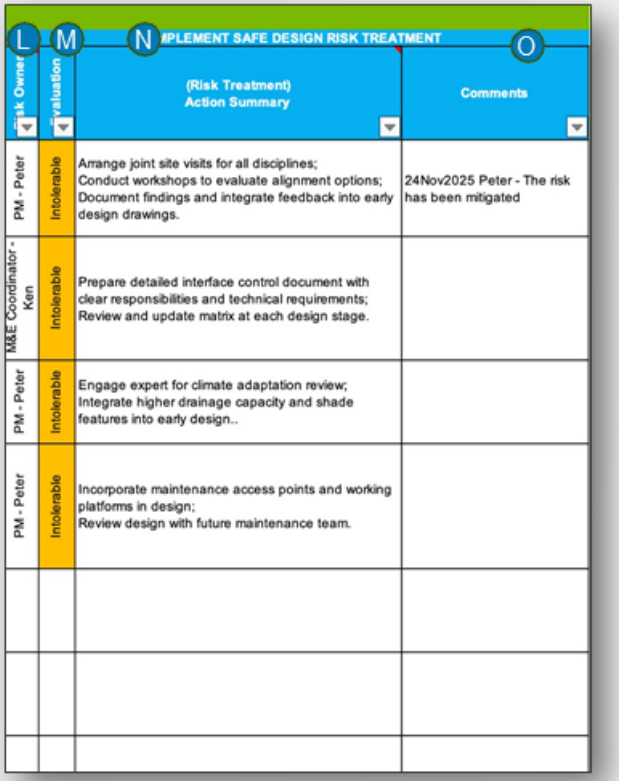
Risk Level Matrix

Consequence \ Likelihood	0 - Eliminated	1 - Rare	2 - Unlikely	3 - Possible	4 - Likely	5 - Almost Certain
A - Catastrophic		High	Critical	Critical	Critical	Critical
B - Major		High	High	Critical	Critical	Critical
C - Moderate		Medium	Medium	High	High	Critical
D - Minor		Low	Low	Medium	High	High
E - Incidental		Low	Low	Low	Medium	Medium

aurecon
Bringing ideas to life

Design Risk Register (5/5) 3

The Design Risk Register is designed to identify and evaluate hazards **during the design and construction phases of a project**. It assesses the severity of potential accidents, mitigates construction hazards, and documents significant risks. It is updated by the design team during the deign and tender stage, and by the Main Contractor during the Construction Phase to incorporate any relevant design changes and address emerging hazards.



L	M	N	O
		IPLEMENT SAFE DESIGN RISK TREATMENT	
Risk Owner	Evaluation	(Risk Treatment) Action Summary	Comments
PM - Peter	Intolerable	Arrange joint site visits for all disciplines; Conduct workshops to evaluate alignment options; Document findings and integrate feedback into early design drawings.	24Nov2025 Peter - The risk has been mitigated
M&E Coordinator - Ken	Intolerable	Prepare detailed interface control document with clear responsibilities and technical requirements; Review and update matrix at each design stage.	
PM - Peter	Intolerable	Engage expert for climate adaptation review; Integrate higher drainage capacity and shade features into early design..	
PM - Peter	Intolerable	Incorporate maintenance access points and working platforms in design; Review design with future maintenance team.	

Item	Column Name	Description
L	Risk Owner	Per the header this is the person who should be responsible for the risk.
M	Evaluation	This column reflects **the decision of the authorised person** as to whether it is OK to expose harm receptors to the risk &/or whether additional actions are required to modify the risk exposure.
N	(Risk Treatment) Action Summary	This column **lists actions required to bring the risk to an acceptable level**. It should be empty if the risk has been evaluated as retired (eliminated) or acceptable. If actions are required the list should be preceded by the leader line "The risk will be actioned to an acceptable level by:".
O	Comments	The comments column is used to record the development of the entries.

aurecon
Bringing ideas to life

Pre-Construction Information 4

The Pre-Construction Information (PCI) **centralises essential project details and health and safety considerations**. It serves as an essential component throughout the project lifecycle, from pre-tender to construction stages, guiding the planning, management, and communication of safety-related information among all designers and contractors. The PCI is **initiated by the client** at the project set-up stage, continuously **updated by the design team** during the design stages, **included with tender documents** during the tender stage, and **reviewed and transferred to the Health & Safety file** by the main contractor in the construction stage.

Sample Outline of Pre-Construction Information

Item	Section	Exist in the document? (Y/N)	Comment / Notes
1. Project Information			
1.1	A description of the Project		
1.2	Key dates		
1.3	Contact details for the project team		
1.4	The extent and location of the existing information		
1.5	Project arrangemenrts:		
1.5.1	- Planning and managing the construciton work		
1.5.2	- Communication and liaison		
1.5.3	- Security		
1.5.4	- Site hoarding - preventing unauthorised access		
1.5.5	- Site transport - access routes		
1.5.6	- Permit-to-work systems		
1.5.7	- Fire precautions		
1.5.8	- Emergency procedures		
1.5.9	- Means of escape		
1.5.10	- Authorisation requiremens		
1.5.11	- Ground works - excavations confined spaces		
1.5.12	- Smoking and paking restrictions		
2. Safety Hazards			
2.1	Boundaries and access including traffics		
2.2	Restrictions on deliveries, waste collextion or storage		
2.3	Adjacent land uses and projects		
2.4	Existing live and redundant services (i.e. overhead HV and underground utility services including gas, drainage, telecommunications, etc.)		
2.5	Ground conditions (i.e. stability, contamination)		
2.6	Existing stability of structures (i.e. permanent and temporary)		
2.7	Issues relating to plant and equipment		
2.8	Health and safety information in earlier design, construction or 'as-built' drawings		
3. Health Hazards			
3.1	Asbestos		
3.2	Contaminated land		
3.3	Client's activities		
3.4	Storage of hazardous materials		
3.5	Significant design and construction hazards		
3.5.1	- Assumptions and working methods		
3.5.2	- Arrangements for co-ordination of ongoing design work		
3.5.3	- Significant risks identified during design		
3.5.4	- Materials requiring particular precautions		
4. Information in Existing Health & Safety File			
4.1	A description of the Health and Safety File and any conditions relating to its content		
4.2	Asset or Building Manual		

Construction Phase Plan (1/3) 5

The Construction Phase Plan (CPP) is crucial for identifying and mitigating significant health and safety risks throughout the construction project. It is a key document for communicating risk management strategies to all pertinent duty holders during the construction phase. The **initial CPP is developed by the Main Contractor** before construction begins, and both the **Main Contractor and sub-contractors collaboratively update** it with safety details as the project progresses through the construction stage.

Construction Phase Plan			
PLAN			
Project Name			
Client's Information			
Name		**Address**	
Project Details			
Job Description			
Client-Specific Considerations (if any)			
Project Milestones	**Start**		
	Finish		
	Others	Progress Review Date:	
WORK TOGETHER			
Stakeholder & Roles			
List of Parties on Site	Main Contractor		
	Subcontractors		
	Design Team		
	Client Representative		
	Safety Consultant		
	Other		
Main Contractor Designation	Project Manager		
	Site Supervisor		
	DfS Coordinator		
Communication & Coodination	Regular Meetings (frequency, time, and location)		
	On-Site Notice Board		
	Emergency Communication Method		

Construction Phase Plan (2/3) 5

The Construction Phase Plan (CPP) is crucial for identifying and mitigating significant health and safety risks throughout the construction project. It is a key document for communicating risk management strategies to all pertinent duty holders during the construction phase. The **initial CPP is developed by the Main Contractor** before construction begins, and both the **Main Contractor and sub-contractors collaboratively update** it with safety details as the project progresses through the construction stage.

Health & Safety Management		
Safety Documentation & Inspections	H&S Plan	
	Safety Audits (frequency and responsible party)	
	Daily Inspection(checklist and responsible party)	
Site Rules and Inducation	Site Inductions	
	PPE Requirements	
	Site Rules	
Induction Procedures	Site Induction Process (Describe how the induction will be managed.)	
Operational Management		
Traffic Management	Traffic Management Measures (Describe the system for managing vehicle movements on site to ensure safety.)	
Welfare Facilities	On-Site Amenities (Describe the welfare facilities provided on site. E.g. Sanitation, Hydration Points, Locker Rooms and Break Areas)	
Fire Prevention and Emergency Procedures	Emergency Equipment and Procedures (Detail location and maintenance of fire extinguishers, fire watch assignments, evacuation plans, and storage protocols for hazardous materials.)	

urecon

nging ideas to life

Construction Phase Plan (3/3) 5

The Construction Phase Plan (CPP) is crucial for identifying and mitigating significant health and safety risks throughout the construction project. It is a key document for communicating risk management strategies to all pertinent duty holders during the construction phase. The **initial CPP is developed by the Main Contractor** before construction begins, and both the **Main Contractor and sub-contractors collaboratively update** it with safety details as the project progresses through the construction stage.

Main hazards and significant risks may include:

- Site conditions and design-related risks from tender
- Hazards and risks proposed by the contractor or worker
- Common hazards typically found on construction sites

Coordination and Service Management		
Cooperation and Coordination	Regular Coordination Meetings (State frequency and participants of these meetings.)	
	Joint Inspections and Shared Documentation (Detail how inspections and documentation will be conducted and shared.)	

ORGANISE				
Main hazards and significant risks on site, e.g.	**Hazad Exists? (Y/N)**	**What controls do you have**	**Comments**	**Status (Pending /In progress / Implemented)**

Work Type	Aspect	Details
Foundations / Services Trenched / Inground Works	Working / Inspecting in trench	Lack of adequate safety measures in place for protection while working and inspecting in trenches
	Underpinning of existing structure / infrastructure	Unstable and insecure underpinning of the existing structure/infrastructure
	Contaminants in soil	Harmful contaminants present in the soil
	Groundwater	Polluted groundwater or adverse conditions that could affect safety or health
Excavations	Below ground water obstacles	Encountering unexpected utilities or remnants below ground can cause delays and increased costs.
	Installation / noise / vibration / dust	Drilling and pile driving generate noise and vibration
	Effects on Adjacent Structures and Services	Excavations cause subsidence or damage to nearby buildings and disrupt utilities
	Stability / Local / General / Rock Fall	Excavations risk endangers workers and passersby
	Groundwater / Inflow / Diversion / Disposal	Groundwater inflow leads to additional costs and environmental concerns
	Storing / Retention / Fall Protection	Improper storage and retention lead to material falls
	Loads and Access Adjacent Excavations	Adjacent loads and limited access compromise excavation stability and efficiency
	Flat Surface / Sloping Surface / Abrupt Level Changes	Uneven surfaces and level changes increase the risk of slips, trips, and falls.
	Effects of Water	Accumulated water causes erosion, weakens structures, and creates hazardous conditions.
	Liquefaction	Saturated soils causes ground instability and structural damage.
Structural Works (Construction phase)	Access over reinforcement mats / cages – bar spacing	Narrow bar spacing creates trip hazards and limit worker movement.
	Reinforcement congestion limiting soffit access	Congested reinforcement bars restrict access, complicating installation and potentially causing delays.
	Installation of heavy reinforcement cages	Handling and installing heavy reinforcement cages leads to injury
	Exposed ends of reinforcement	Exposed reinforcement ends causes injuries due to improperly managed.
	Glare and sunburn from metal surfaces (metal deck formwork, roof sheeting)	Reflective metal surfaces cause glare and increase the risk of sunburn for workers.
	Shop and site applied paints (chemicals, access)	Poor access causes injuries.
	Construction staging / phasing / temporary works	Poorly planned construction stages or temporary works lead to safety risks and project delays
	Plant access	Restricted or unsafe access for plant machinery leads to delays, equipment damage, or accidents involving workers and machinery.
	Construction staging / phasing / temporary works	Inadequate planning results in conflicts between trades, causing delays, increased costs, and safety hazards.
	Commissioning / start up	Poorly managed commissioning leads to system failures, accidents, or hazardous conditions during the initial operation phase.
	Falling from construction platforms and floors	Falls from heights result in severe injuries or fatalities.
	Falling objects - item dropped etc	Dropped objects cause serious injuries or fatalities to workers below.
	Edge protection	Provide adequate edge protection to avoid severe injuries or death.
	Inadequate back propping	Insufficient back propping results in structural collapse, causing injuries or fatalities.
	Use of Cranes	Operating cranes beyond safe limits result in tipping or collapse, endangering

0 Document Control | 1 Template Clean | 2 Template Sample | 3 Potential Risks | +

A potential risk list has been provided to support the identification and management of potential hazards

aurecon
Bringing ideas to life

Health & Safety File 6

The Health & Safety File is designed to **cover all relevant information about a building's construction, operation, and maintenance to ensure safe future practices**. It aims to enhance the health and safety of maintenance personnel and building users by guiding informed decision-making and effective risk management. The Health & Safety File is updated throughout the project lifecycle: specified by the client pre-tender, compiled by the designer in design stage and collaboration with contractor during construction, and the main contractor delivers the updated file at handover

Sample Outline of Health & Safety File (Asset or Building Manual)		
Section	**Description**	**Details**
-	Front Page	Title of the project, the particular element of the project covered by the manual, the relevant manual reference, and the date of issue of the manual.
-	Content Page	A fully detailed index of the Operation and Maintenance Manual. Title/Page number etc.
1	**Introduction**	Description of the manual content and structure. How to use it and why it is being issued. [could be standardized across all your projects]
2	**Project Information**	Include detailed information on the project. [can take information from the Owner's Project Requirements (OPR), Basis of Design (BOD), Specifications, Commissioning Plan/Cx Plan]
3	**Project Specifications**	Include a register of Specifications that were utilized on the project.
3.1	Building Management System (BMS) Specification	Include BMS Systems Specification.
3.2	Extra Low Voltage (ELV) Systems Specification	Include ELV Systems Specification.
3.3	Electrical Systems Specification	Include Electrical Systems Specification.
3.4	Fire Systems Specification	Include Fire Systems Specification.
3.5	Mechanical/ Heating, ventilation, and air conditioning (HVAC) Systems Specification	Include Mechanical/ Heating, ventilation, and air conditioning (HVAC) Systems Specification.
3.6	Plumbing and Drainage Systems Specification	Include Plumbing & Drainage Systems Specification.
4	**As-Built Drawings**	
4.1	BMS System As-Built Drawings	Include a register of BMS Systems As-Built drawings.
4.1.1	Schematics/Single Line	Include a set of as-built schematics/single line diagrams for the BMS Systems.
4.1.2	Layouts	Include a set of as-built layouts for the BMS Systems.
4.1.3	Controls System As-Built Drawings	Include a register of Control Logics As-Built drawings.
4.2.1	Control Logics	Include a set of as-built Control Logics.
4.3	ELV System As-Built Drawings	Include a register of ELV Systems As-Built drawings.
4.3.1	Schematics/Single Line	Include a set of as-built schematics/single line diagrams for the ELV Systems.
4.3.2	Layouts	Include a set of as-built layouts for the ELV Systems.
4.4	Electrical System As-Built Drawings	Include a register of Electrical Systems As-Built drawings.
4.4.1	Schematics/Single Line	Include a set of as-built schematics/single line diagrams for the Electrical Systems.
4.4.2	Layouts	Include a set of as-built layouts for the Electrical Systems
4.5	Fire System As-Built Drawings	Include a register of Fire Systems As-Built drawings.
4.5.1	Schematics/Single Line	Include a set of as-built schematics/single line diagrams for the Fire Systems.
4.5.2	Layouts	Include a set of as-built layouts for the Fire Systems.
4.6	Mechanical/HVAC System As-Built Drawings	Include a register of Mechanical/HVAC Systems As-Built drawings.
4.6.1	Schematics/Single Line	Include a set of as-built schematics/single line diagrams for the Mechanical/HVAC Systems.
4.6.2	Layouts	Include a set of as-built layouts for the Mechanical/HVAC Systems.
4.7	Plumbing and Drainage Systems As-Built Drawings	Include a register of Plumbing Systems As-Built drawings.
4.7.1	Schematics/Single Line	Include a set of as-built schematics/single line diagrams for the Plumbing and Drainage Systems.
4.7.2	Layouts	Include a set of as-built layouts for the Plumbing & Drainage Systems.
5.0	**Electrical Discrimination Study**	Include the approved discrimination study report for the electrical systems.
6.0	**BMS Graphic Document**	Include the approved BMS Graphic document.
7.0	**BMS Access/Messaging As-Built Information**	Include the approved information relating to access to the BMS/Control Systems and messaging
8.0	**Summary of Systems Installed**	Provide a summary of each system's components, location, and how they are designed to operate. [can take from specifications, drawings, control logics]
9.0	**Asset Register**	Include a detailed list of equipment for each type of system that has been installed. 1. Equipment ID 2. Type 3. Manufacturer 4. Model 5. Size/Rating 6. Building/Floor/Room [usually taken from the progress trackers that were created through the project]
10.0	**System Operation**	Expand on the way in which each of the systems operates: 1. Start-Up, interfaces/interlocks 2. Setpoints 3. Running 4. Shut down, interfaces/interlocks 5. Fault finding/problem solving [Use specifications, drawings, control logics, manufacturers data, and information].
11.0	**Manufacturers Literature/Information**	Include all the manufacturer's information relating to the equipment, ancillaries, and systems. [Use the asset register for reference of what would be needed]
11.1	[Add each type]…	
11.2	[Add each type]…	
11.3	[Add each type]…	
12.0	**Health and Safety**	
12.1	Safety Procedures	Include all safety processes and procedures related to the operation, access, and maintenance of the equipment and systems. Don't forget a register/index to show what is included. [Use the project health and safety file for examples and reference]
12.2	Control of Chemical/ Substances Hazardous to Health	Include all Chemical/substances hazardous to health data sheets for items related to the maintenance, cleaning, and disposal of chemicals [paint, adhesives, gases, and chemicals]. Don't forget a register/index to show what is included. [Use the project health and safety file for examples and reference]
12.3	Risk Assessments	Include all risk assessments related to the operation, access, and maintenance of the equipment and systems. Don't forget a register/index to show what is included [Use the project health and safety file for examples and reference]
12.4	Arc Flash Study	Include the approved Arc Flash Study for the electrical systems.
13.0	**Disposal of Equipment/Products**	Provide information on how equipment and products should be disposed of.

aurecon
Bringing ideas to life

aurecon

Bringing ideas to life

linkedin.com/company/Aurecon

youtube.com/user/AureconGroup

twitter.com/Aurecon

facebook.com/Aurecon

instagram.com/Aurecon

aurecongroup.com/podcast

Bringing ideas to life